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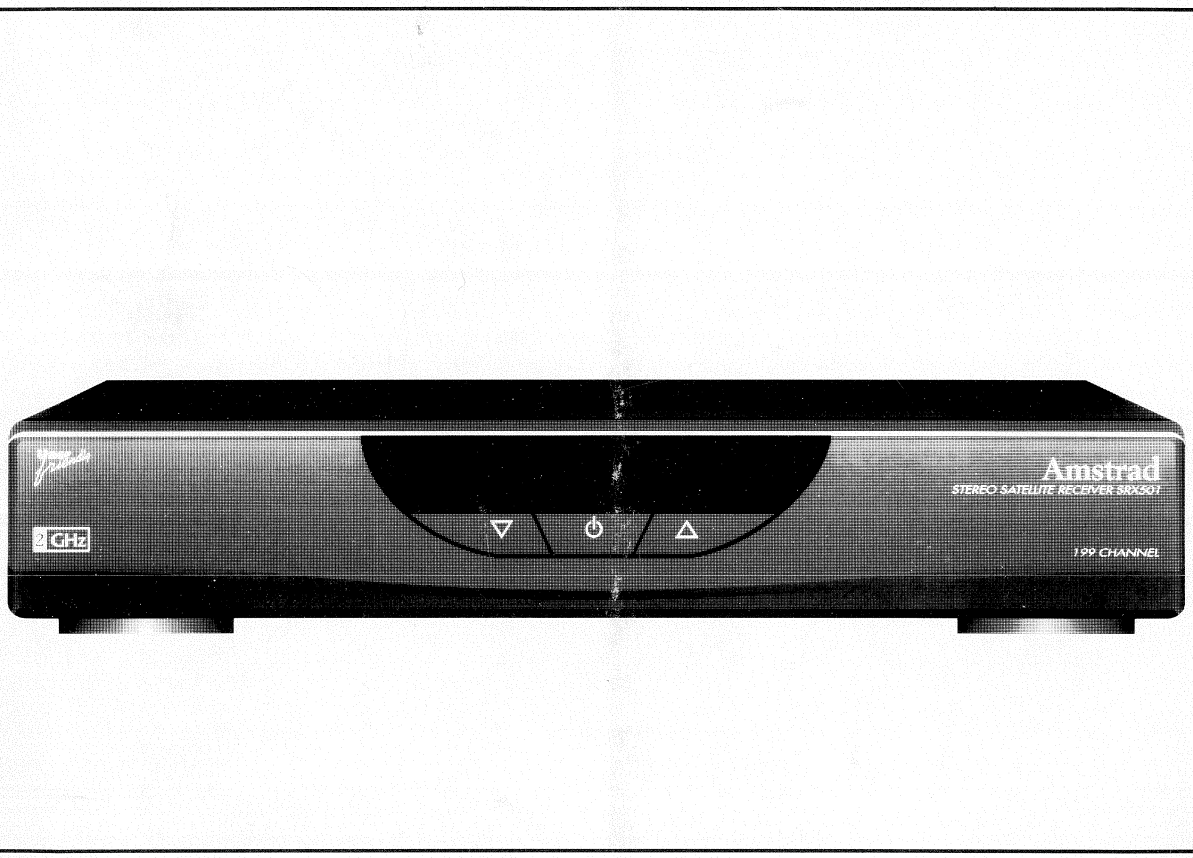

SRX501

SATELLITE RECEIVER

SERVICE MANUAL

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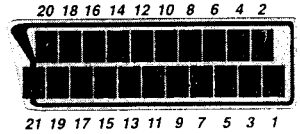
Date of first publication June, 95

Amstrad reserves the right to supply selective components.
Information published was latest available at the time of print.

Technical Specifications

Receivers

Dimensions:	335 x 250 x 62mm
Weight:	1.9kg
Mains Supply:	230V AC 50 Hz
Tuning Range:	
LNB High Band Switching:	22kHz Tone (600mV p-p)
Channel Bandwidth:	
Local Oscillator Range:	
Fine Tuning range:	±10MHz
Dynamic Range:	
AM Co-channel Interference : Threshold	-15dB
Threshold:	8dB C/N (with threshold extension)
RF Output:	Channel 38 (adjustable 30-40)
Audio subcarrier:	5.5-8.5MHz
Audio Output Level:	2V p-p @ 50kHz Input Deviation
Audio Response:	40Hz-15kHz
I/O Connectors:	LNB 75 Ohm F Connector x2 RF 75 ohm Co axial Audio out RCA x2 scart/Peritel x2 Decoder x1



* (loop-through only)
† (dealer use only / TV SCART/PERITEL socket only)

TV SCART/PERITEL
VCR SCART/PERITEL

1	Audio out R	12	Serial interface (clock) †
2	Audio in R	13	Red ground
3	Audio out L	14	Serial interface ground †
4	Audio ground	15	Red*
5	Blue ground	16	Blanking*
6	Audio in L	17	Video ground
7	Blue*	18	Blanking ground
8	External switching	19	Video out
9	Green ground	20	Video in
10	Serial interface (data) †	21	Shield/ground
11	Green*		

DECODER

1	Audio out R	11	Green
2	Audio in R	12	MAC baseband out
3	Audio out L	13	Ground
4	Audio ground	14	(not used)
5	Ground	15	(not used)
6	Audio in L	16	(not used)
7	(not used)	17	Video ground
8	Audio/video INT/EXT	18	(not used)
9	Ground	19	PAL baseband out (filtered/clamped)
10	PAL baseband out (unfiltered/unclamped)	20	Video in
		21	Shield/ground

SAFETY TESTS

Please note: When any work is carried out on this product, the following safety tests must be carried out to ensure continued safety.

1) Flash test from the mains lead with live and neutral joined together to all accessible external metal points at 3kV.

2) Megger test at 500V DC from the mains lead with live and neutral joined together to all accessible metal points. reading must not fall below 4 M Ohms.

In keeping with our policy of continually improving our service and technical quality of our products, we reserve the right to change type, manufacturers, sources of supply or technical specifications at any time.

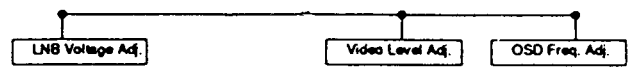
Amstrad Plc.
Brentwood House,169 Kings Road, Brentwood Essex CM14 4EF

ALIGNMENT INSTRUCTIONS

NOTE:
Electrical adjustment is required after replacing certain components and certain mechanical parts. It is important to perform these adjustments only after all repairs and replacements have been completed. Also, do not attempt these adjustments unless the proper equipment is available.
NOTE: This flow chart indicates, the electrical adjustment step.

TEST EQUIPMENT REQUIRED

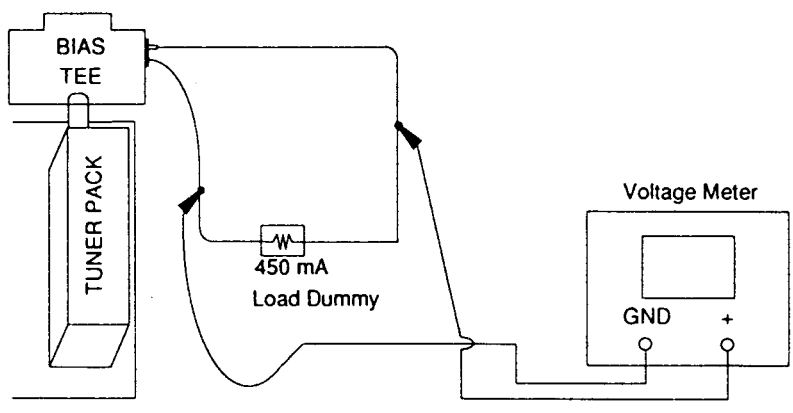
1. Oscilloscope: Dual-trace with 10:1 probe,
   V-Range: 0.001~50v/Div.,
   F-Range: AC~DC-20MHz
2. PAL Pattern Generator
   (Color bar with 100% white)
3. AC Voltmeter (RMS)



1 . LNB Voltage Adjustment

Purpose:
To separate receiving signal into horizontal and vertical polarisation.
Symptom of Misadjustment:
Receiving signal is not separated into horizontal and vertical correctly.

Test Point	Adj. Point	Mode	Input
LNB Voltage LNB: 450mA Load LNB Polarity: H (+17V)	RV600 (PSU PCB)	—	—
Tape	M. EQ.	Spec.	
—	Voltage Meter	H: 17.2~18.0V (V: 12.8~14.0V)	
Connections of M. EQ.			



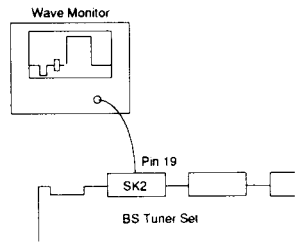
Reference Notes:
1. Check that LNB Polarity is "H" on the step 1 (Vp-p Voltage Adjustment).
2. Connect equipment as shown in the above table.
3. Adjust RV1 to obtain 17.6V LNB Voltage.

2. Video Level Adjustment

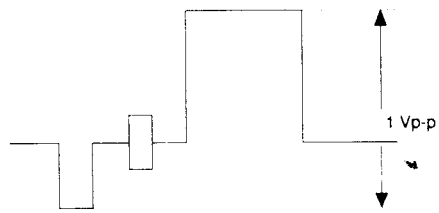
Purpose:
Adjust Contrast level of video signal at TV Scart/Modulator output.
Symptom of Misadjustment:
Display will be too dark or too bright.

Test Point	Adj. Point	Mode	Input
SK2 Pin 19 LNB: 450mA Load LNB Polarity: H (+17V)	RV1 (Main PCB)	—	CH8: 1317.5MHz, White 100%, RF= -45dBm, C/N= Max
Tape	M. EQ.	Spec.	
—	Wave Monitor	Video Level: 1Vp-p±0.5Vp-p	

Connections of M. EQ.



Figure



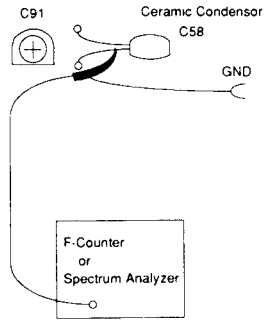
Reference Notes:
1. Input CH8: 1317.5MHz, White 100%, RF=-45dBm, C/N=Max.
2. Connect the signal from SK2 Pin 19 to Wave Monitor.
3. Adjust RV1 (Main PCB) to obtain 1Vp-p.

3. OSD Freq. Adjustment

Purpose:
To adjust frequency of OSD (On Screen Display) control signal.
Symptom of Misadjustment:
OSD may be not distinct or colour background may be grey.

Test Point	Adj. Point	Mode	Input
C58 LNB: 450mA Load LNB Polarity: H (+17V)	C91	—	—
Tape	M. EQ.	Spec.	
—	Spectrum Analyzer or F-Counter	OSD Freq. : 17.734475MHz±200Hz	

Connections of M. EQ.



Reference Notes:
1. Push "TIMER" key on the Remote Control to place units in TIMER mode.
2. Connect equipment as shown in the above table.
3. Adjust C91 to obtain 17.734475MHz.

1. PSU Switching IC Functional Description

IC604 implements three pins, all functions necessary for the off line switch mode power supply. IC604 integrates a high voltage (700 Volts) power MOSFET and CMOS control circuitry. The control circuitry switches the integrated power MOSFET at a fixed frequency of 100kHz ±10% while the power supply is operating.

The control circuitry adjusts the duty cycle of the power MOSFET to maintain the regulation of the power supply output. it performs this function by monitoring the current feedback into the Control pin 1. The control circuitry also protects the power MOSFET by monitoring its current and temperature.

If you need to change IC 604 be sure that the heatsink compound is used and device tab is firmly soldered to PCB as the body of IC604 comes fully in contact with PCB. The SMT 'D-PAK' device should be replaced with a TO220 version as an upgraded device.

2. Audio Internal/External Description version as an upgraded regulator

Overview
Telecom Satellites scramble their wide audio sub carrier at either 5.8 or 6.60MHz, The French Canal+ (Systere) decoder de-scrambles this audio along with vision. Additionally there is phased changeover to Wegner companded stereo pairs (7.02/7.20 etc. as Astra).

Unfortunately the system decoders are not sophisticated to detect scrambled audio present so they are configured to always de-scramble i.e. they will scramble clean audio too.

Circuit Description
Audio internal external control forms the audio source to be either internal (clear) or external (de-scrambled). The simple Transistor circuit on the int/ext PCB forms an OR gate forcing IC10 control pins to direct the correct stereo to the TV and VCR Scart sockets dependent on the setting of audio in the set-up menu.

3. PSU Fault Finding Instructions

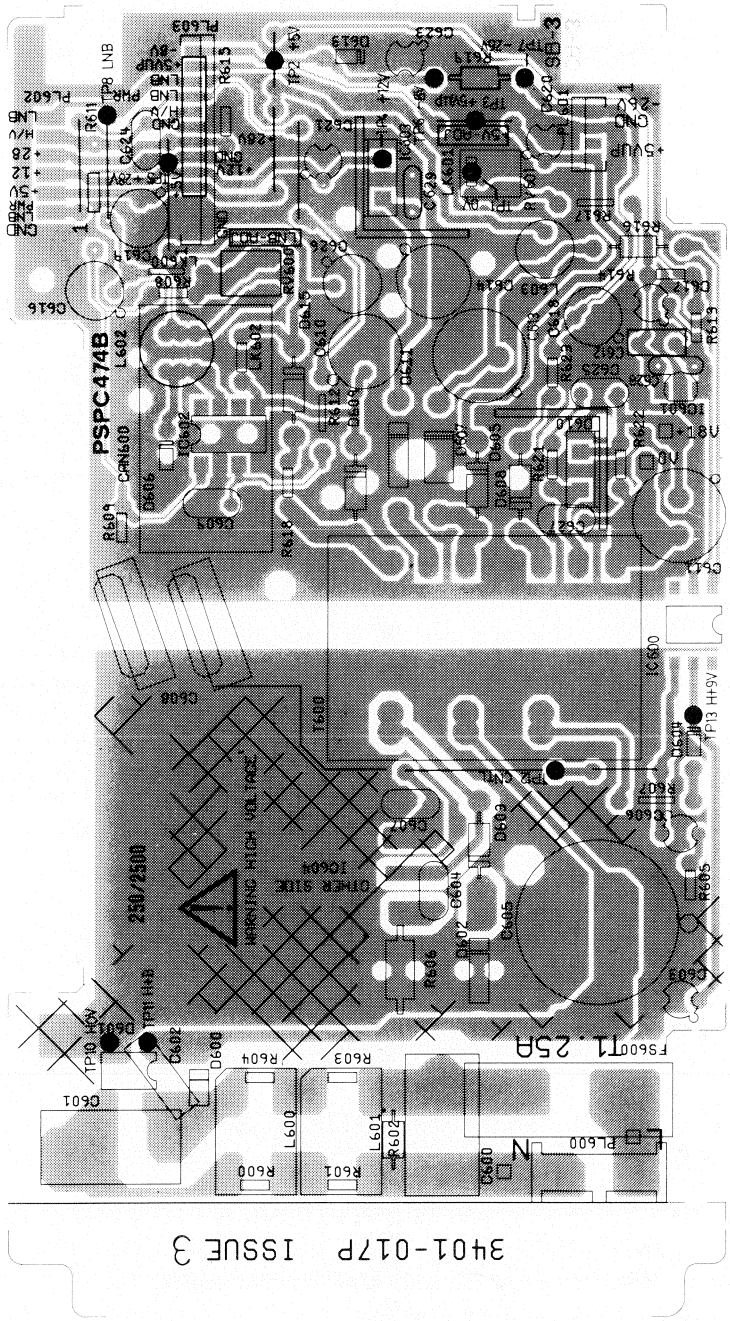
PSU Check: If All DC voltage rails are dead.

a) REMOVE the mains power from unit.
b) Inspect the fuse fitted to the PSU PCB. If blown replace with an identically rated fuse. Re-apply power. If the fuse blows, go to the test 3b).
c) IC604 test: Disconnect mains from the unit. Remove the two screws that hold the PSU PCB in place. Locate IC604 soldered flat onto a large silver ground area on the underside of the PSU PCB. Inspect IC604 body; if it looks chipped, cratered or burnt replace (see section1) and repeat the fuse check.

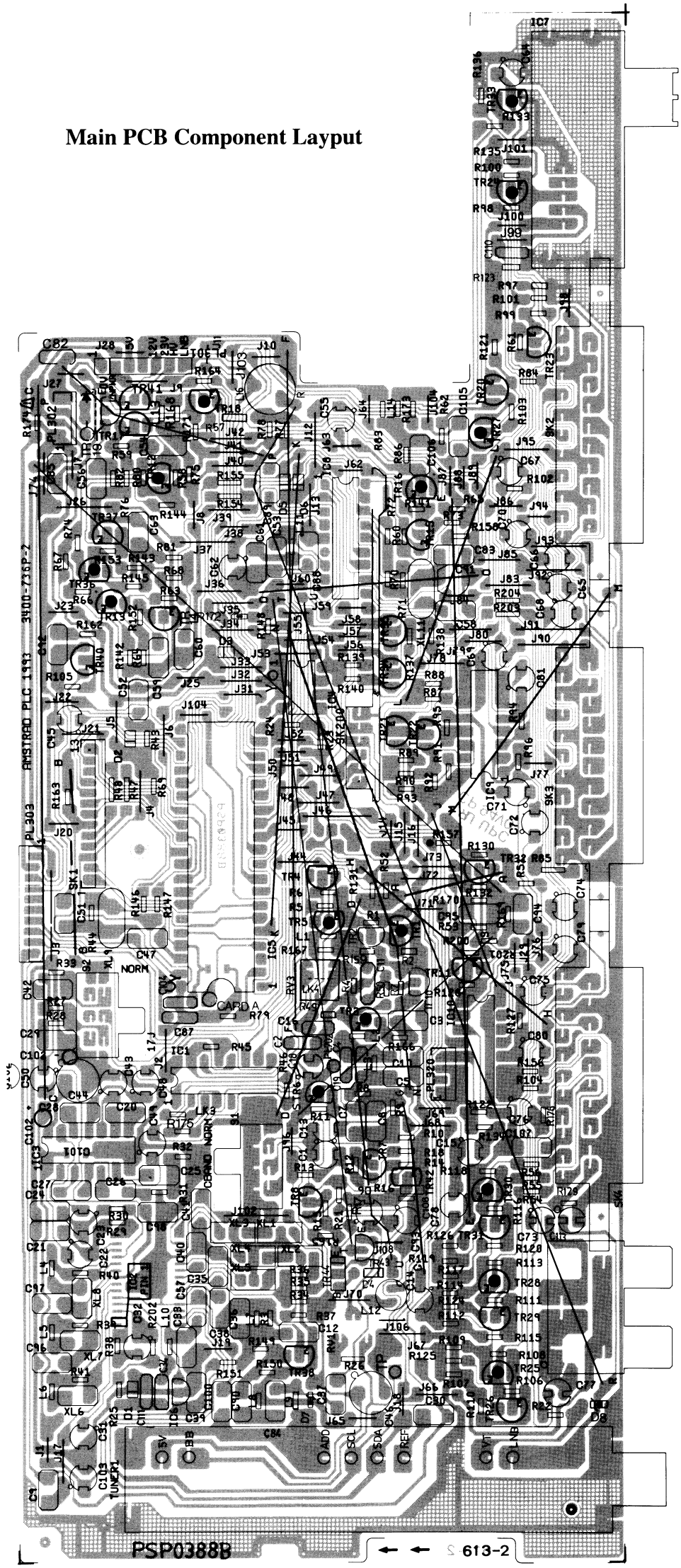
Checks all DC Voltage rails to main PCB.

a) Apply mains power to unit. Led should go red.
b) Connect the -ve lead of a voltmeter to the tuner's metal mounting bracket (0V) or to any of the PCB links silk-screened 0V. (Note: this test relies on a good 0V link between the PSU and main PCBs).
c) Measure the DC voltage on the silk-screen link marked "+5V" (found on PL602).
i. If it is +5V +/- 0.25V Pass to test 1d), else continue.
ii. If the DC voltage on D607's cathode, (D607 is found below D611 on PSU PCB), is +5V +/- 0.5V (+6V off load). Pass to test 1d) else continue.
iii. With power off, check for good continuity between D607 cathode and the +5V link to the main PCB.
d) Measure the DC voltage on the silk-screen link marked "+12V" (found on PL602).
i. If it is +12.5V +/- 0.5V Pass to test 1e), else continue. (up to +16V off load).
ii. If the DC voltage on D611's cathode is +12V +/- 0.5V Pass to test 1e), else continue.
iii. With power off, check for good continuity between the +12V line to main PCB.
e) Measure the DC voltage on the silk-screen link marked "+28V" (found on PL602).
i. If it is +29V +/- 2V Pass to test 1f), if not continue.
ii. If the DC voltage on D609's cathode (PSU) is +30V +/- 3V Pass to test 1f), if not continue (up to +37V off load).
iii. With power off, check for good continuity between D609 cathode and the +28V link
f) Measure the DC voltage at D8 cathode (Main PCB by Tuner)
Should be 27V±5%. If not replace D8.

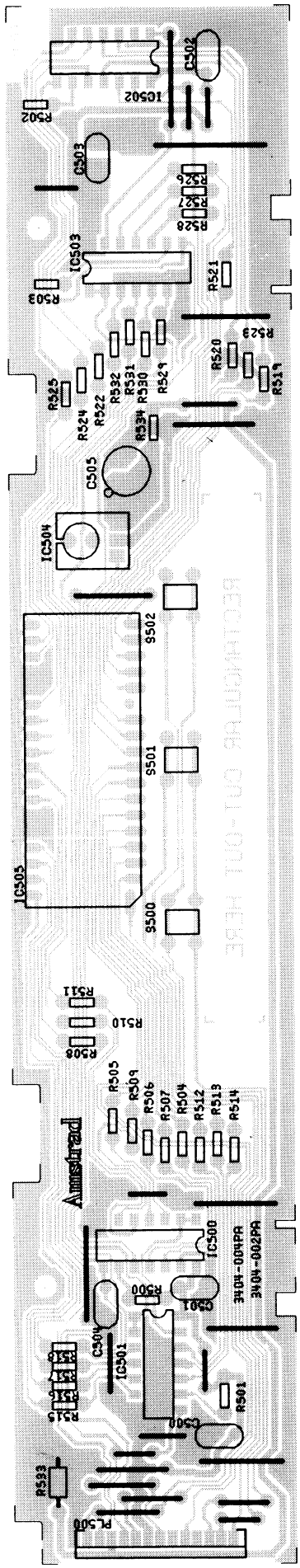
PSU PCB Component Layout

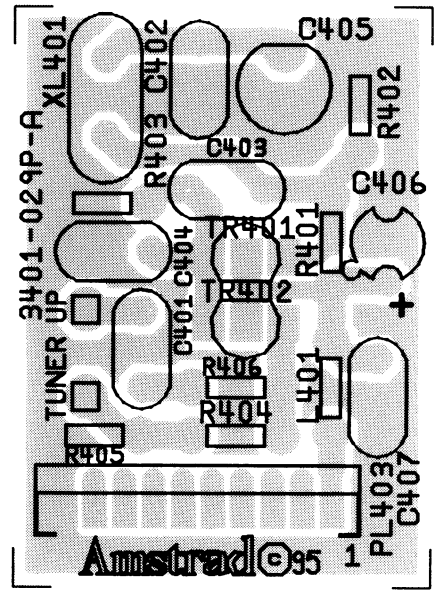


Main PCB Component Layput



Display & 4MHz PCB Component Layout

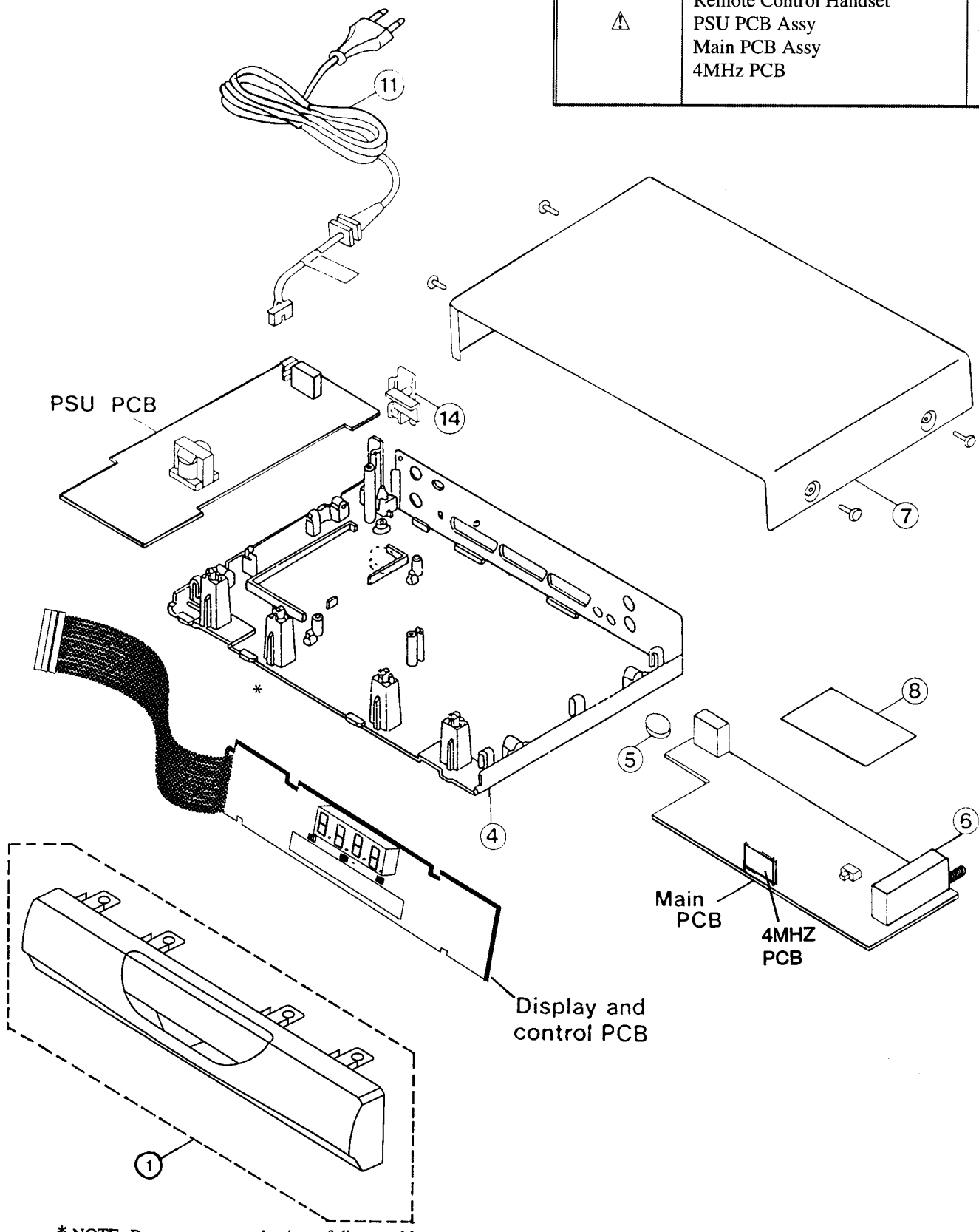




SRX501 Cabinet Parts List

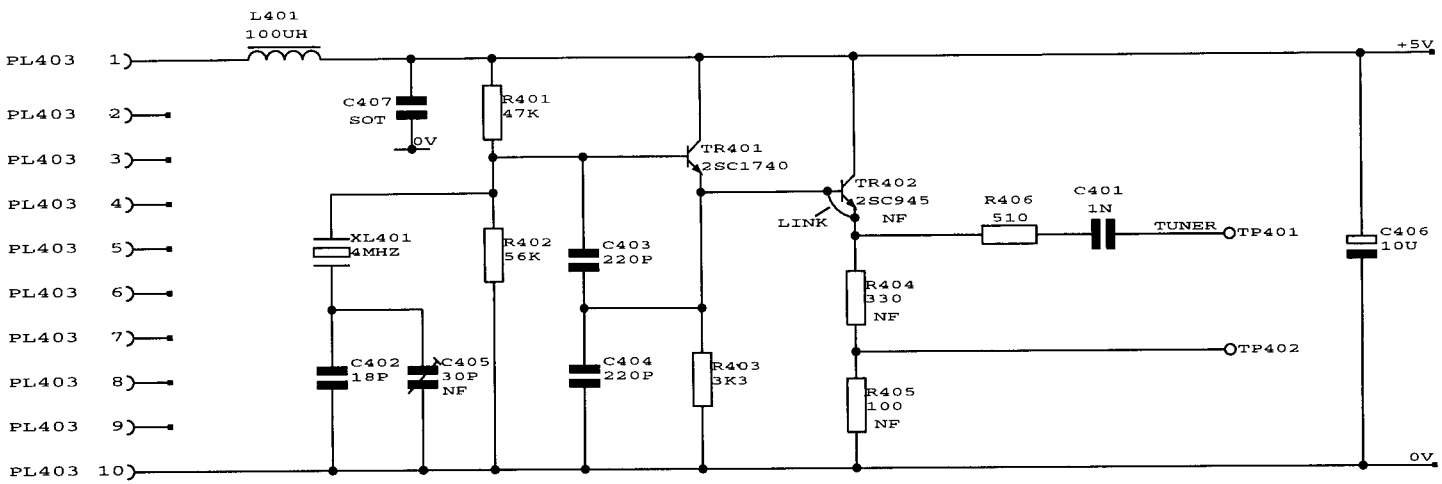
Ref. No.	Description	Pt. No.
1	Front Panel Assy	242794
4	Bottom Cabinet	242198
5	Foot Rubber Rear	241545
6	Tuner Assy	242192
7	Top Cabinet	242155
11 ⚠	Mains Lead	240861
14	Rear Insert	240741
	Foot Rubber Front (Part of F Panel)	
	Remote Control Handset	242663
⚠	PSU PCB Assy	242795
	Main PCB Assy	
	4MHz PCB	

CABINET EXPLODED VIEW



* NOTE: Remove screw at the time of disassembly

Schematic Diagram 4MHz PCB



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PSU Schematic Diagram

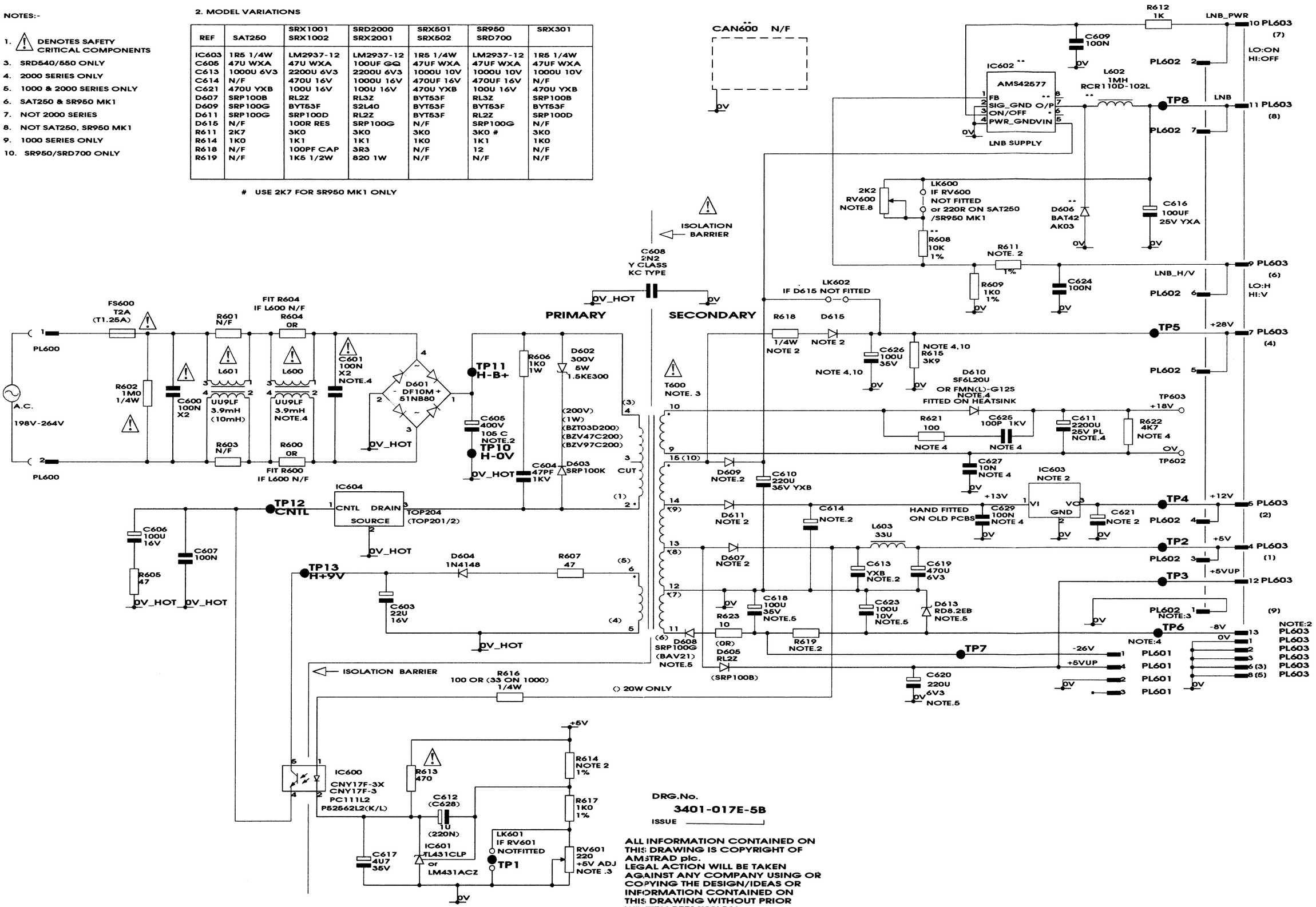
NOTES:-

1. ⚠ DENOTES SAFETY CRITICAL COMPONENTS
3. SRD540/550 ONLY
4. 2000 SERIES ONLY
5. 1000 & 2000 SERIES ONLY
6. SAT250 & SR950 MK1
7. NOT 2000 SERIES
8. NOT SAT250, SR950 MK1
9. 1000 SERIES ONLY
10. SR950/SRD700 ONLY

2. MODEL VARIATIONS

REF	SAT250	SRX1001 SRX1002	SRD2000 SRX2001	SRX501 SRX502	SR950 SRD700	SRX301
IC603	1R5 1/4W	LM2937-12	LM2937-12	1R5 1/4W	LM2937-12	1R5 1/4W
C605	47U WXA	47U WXA	100UF GQ	47UF WXA	47UF WXA	47UF WXA
C613	1000U 6V3	2200U 6V3	2200U 6V3	1000U 10V	1000U 10V	1000U 10V
C614	N/F	470U 16V	1000U 16V	470UF 16V	470UF 16V	N/F
C621	470U YXB	100U 16V	100U 16V	470U YXB	100U 16V	470U YXB
D607	SRP100B	RL2Z	RL3Z	BYT53F	RL3Z	SRP100B
D609	SRP100G	BYT53F	S2L40	BYT53F	BYT53F	BYT53F
D611	SRP100G	SRP100D	RL2Z	BYT53F	RL2Z	SRP100D
D615	N/F	100R RES	SRP100G	N/F	SRP100G	N/F
R611	2K7	3K0	3K0	3K0	3K0 #	3K0
R614	1K0	1K1	1K1	1K0	1K1	1K0
R618	N/F	100PF CAP	3R3	N/F	12	N/F
R619	N/F	1K5 1/2W	820 1W	N/F	N/F	N/F

USE 2K7 FOR SR950 MK1 ONLY



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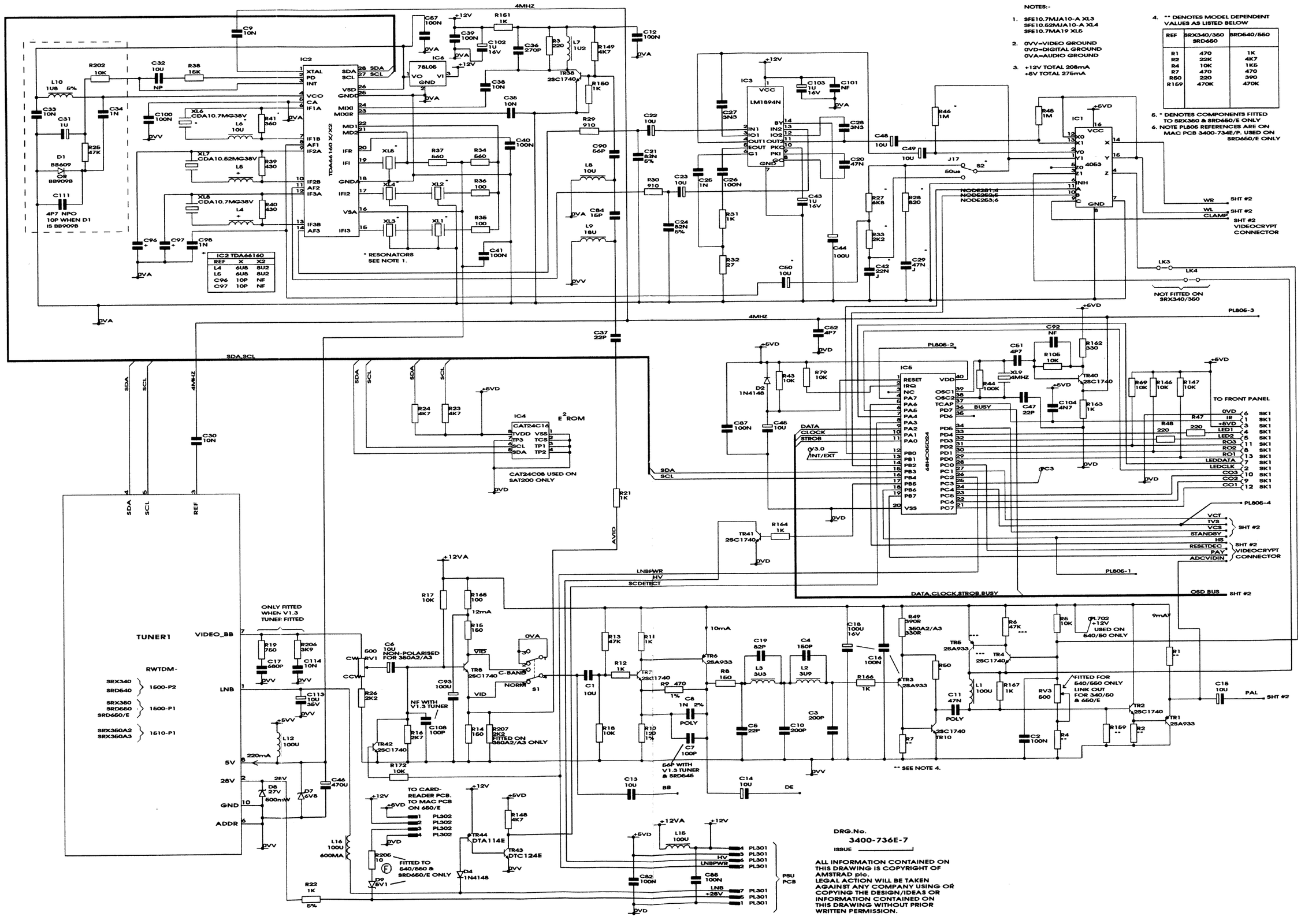
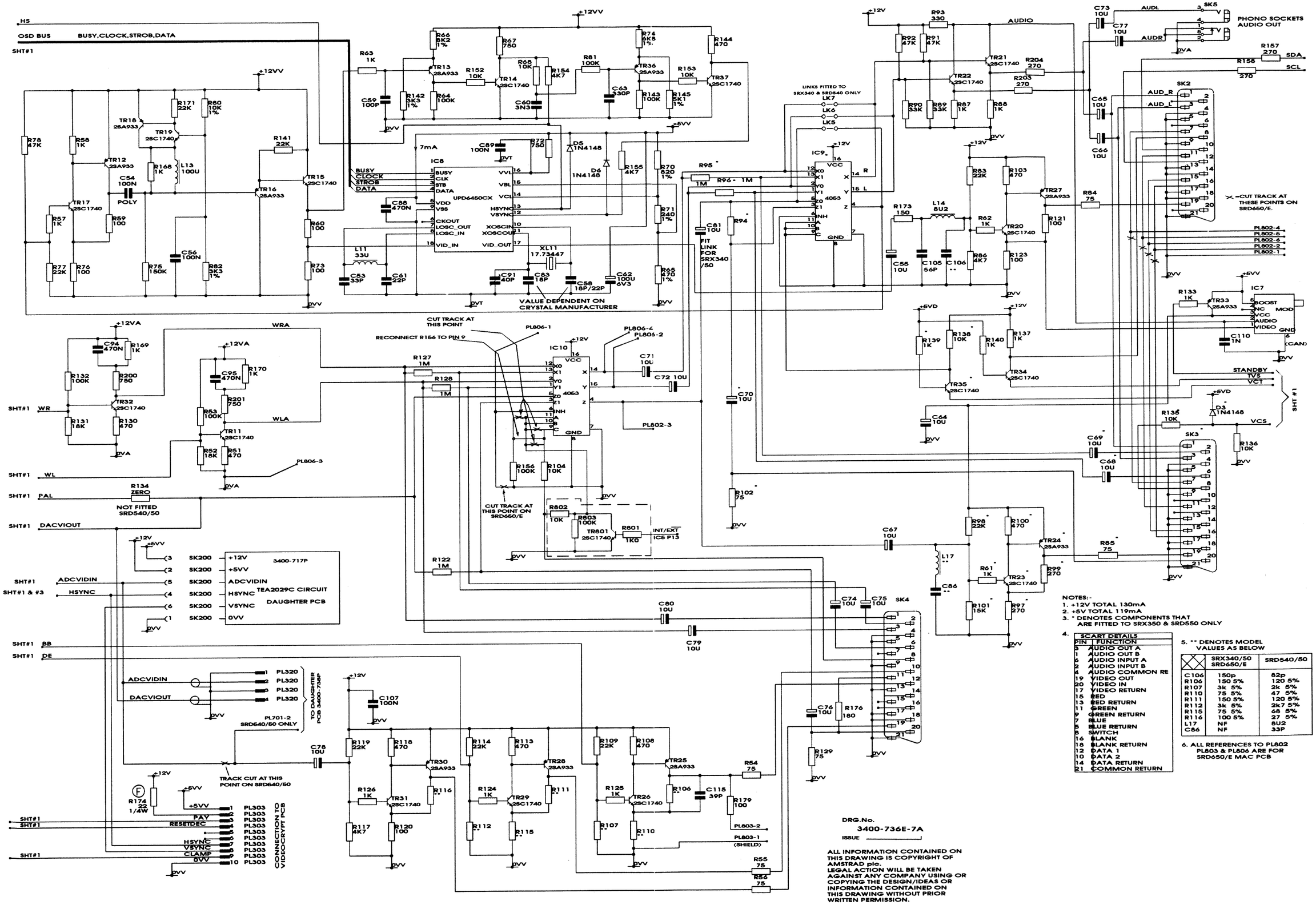
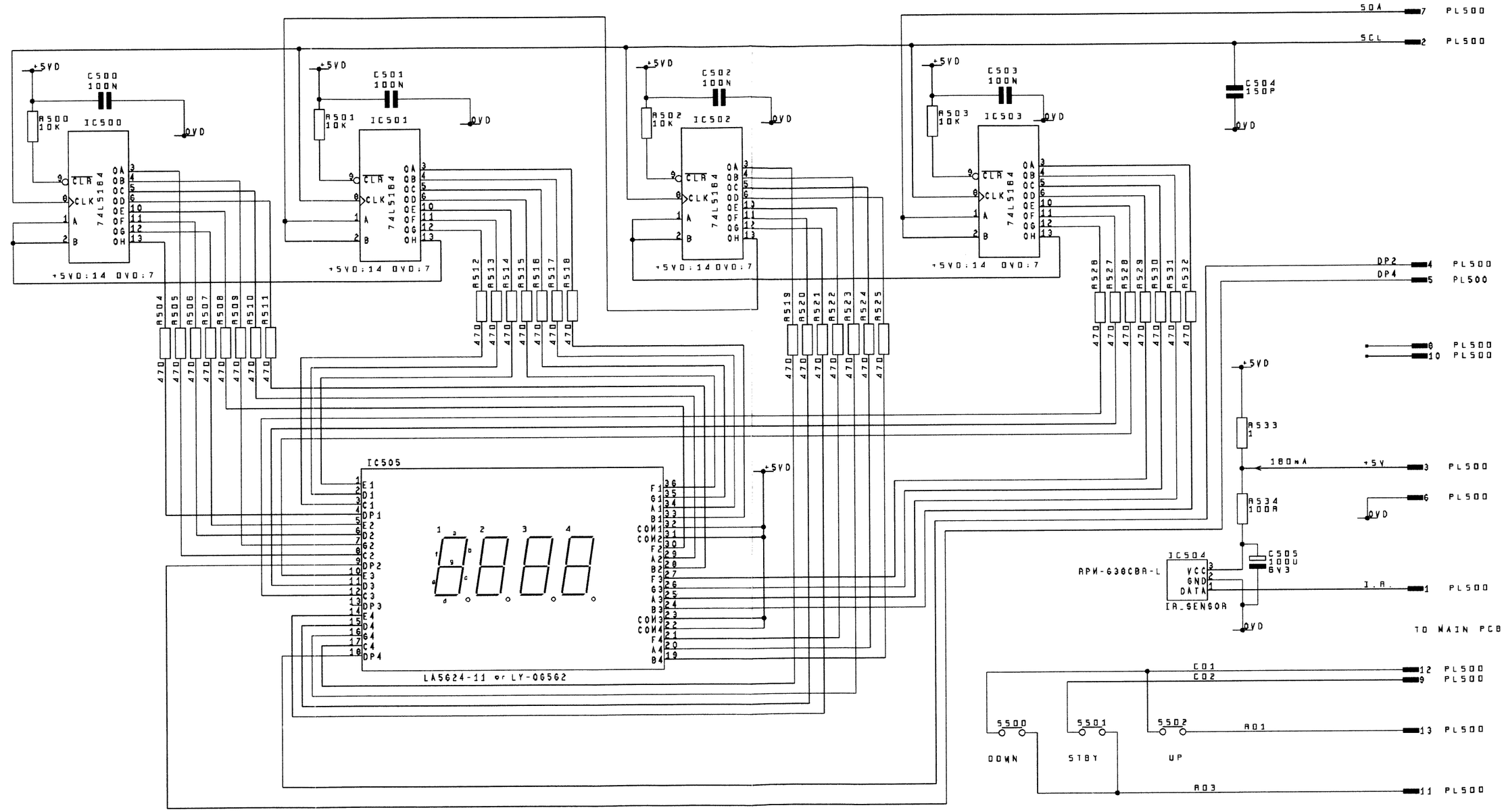
Schematic Diagram Main, Video, Audio & Microprocessor



Schematic Diagram Main Output Switching



Schematic Diagram Display PCB



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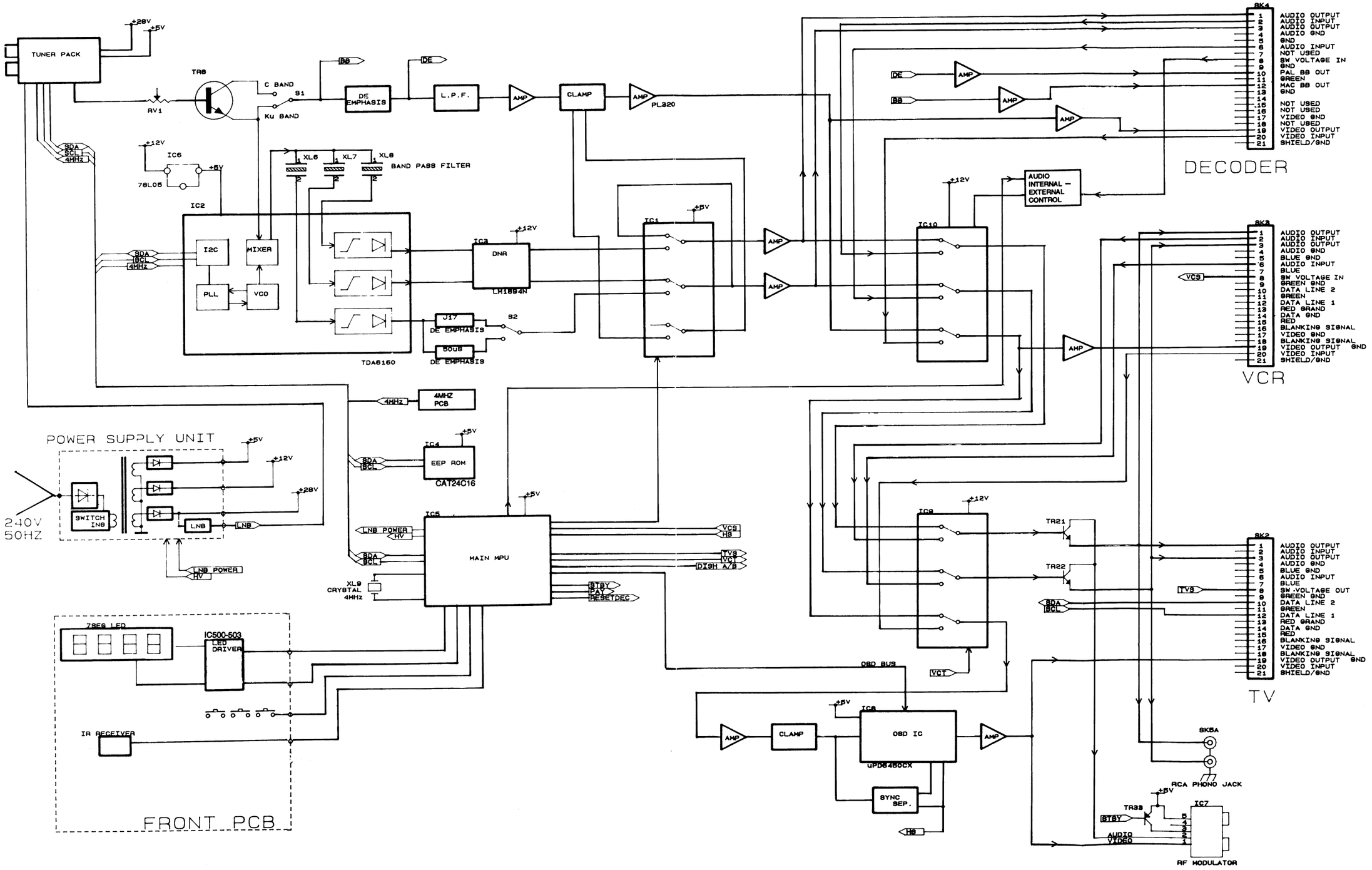
SRX501 BLOCK DIAGRAM



Test Waveforms

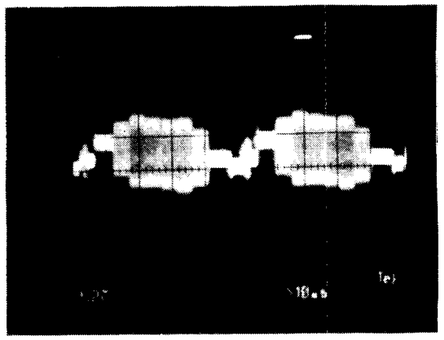


Fig.1 TP Junction of RV1 & R19
Video Baseband

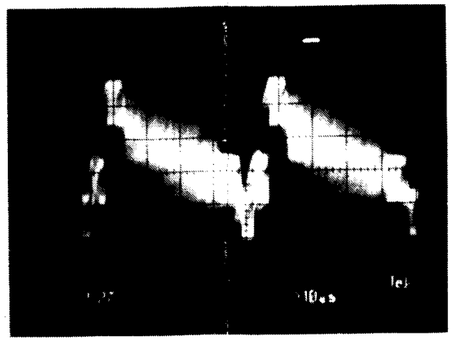


Fig.2 TP TR6 Collector
De Emphasis Video

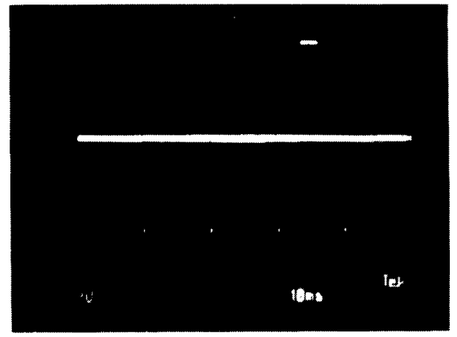


Fig 7 TP D6 5 5Vp-p
VSynch (OSD)

Fig.3 TP TR10 Collector
Sub Carrier Filter

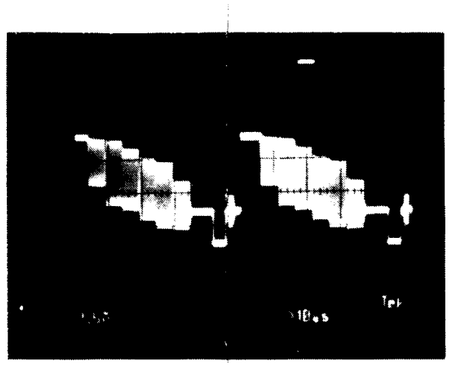


Fig 4 TP Jn of C11 & R167 1.6Vp-p
Clamped (Ed Removed)

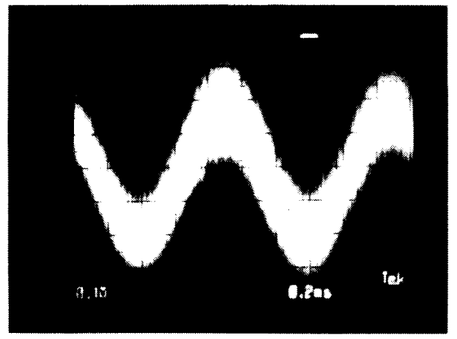


Fig 10 TP Jn R29 & IC2 Pin14
Audio (Left)

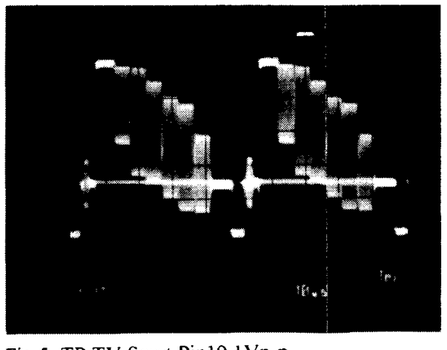


Fig.5 TP TV Scart Pin19 1Vp-p
Video Out

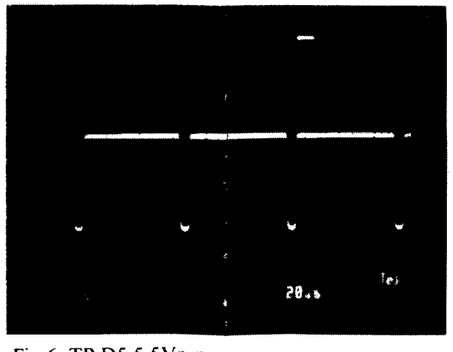


Fig.6 TP D5 5.5Vp-p
HSynch (OSD)

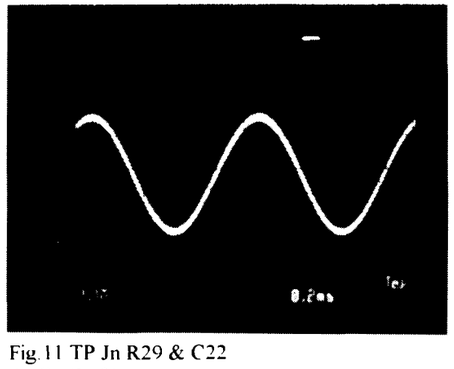


Fig.11 TP Jn R29 & C22
Audio (Left)

VOLTAGE CHARTS

ICs

IC1	MC14053BCP
PIN 1	2.23V
2,12,14,15	2.42V
3	2.03V
4,5	1.72V
6-8,10,11	1.72
9	0.46V
13	2.33V
16	5.09V
IC2	**TDA61602X**
PIN 1	0.41V
2	2.51V
3	1.31V
4,26	4.92V
5,8,15,16,18,25	0
6,7,10	2.27V
9,11	2.26V
12,13	2.25V
14,17,19-21	2.32V
22	4.15V
23,24	2.94V
27,28	5.07V
IC3	**LM1894N**
PIN 1	12.78V
2,13	6.3V
3,14	6.32V
4	6.33V
5	5.39V
6	0.74V
8	5.86V
9	1.18V
10	1.28V
11	6.53V
12	6.31V
IC4	**24C16**
PIN 1-4,7	0
5	5.09V
6	4.01V
8	4.07V

IC5	68HC05 CPU
PIN 1,2,8,10,12	5.09V
15,16,24,29-31	
33,40	
3,7,9,11,13,14	0
17,18,20-23	
25,26,28,34-36	
4	4.94V
5	5.14V
19	5.01V
32	2.98V
37	4.78V
38	2.25V
39	2.27V
IC6	**78L05AC**
PIN 1	12.77V
2	0
3	4.95V
IC8	**UPD6450CX-002 OSD**
PIN 1,3,9	0
2	4.92V
4,5,10,11	4.92V
6	2.5V
7	2.4V
8	2.36V
12	5.49V
13	5.10V
14	2.29V
15	1.49V
16	2.58V
17	1.74V
18	1.73V
IC9	**MC14053BCP**
PIN 1	2.76V
2,12	3.01V
3	3.9V
4,5	4.1V
6-8	0
9-11	0.12V
13	2.68V
14	2.94V
15	3V
16	12.76V

TRANSISTORS

REF Q/TR	C	B	E
1	12.31V	4.69V	12.82V
6	12.01V	8.02V	1.67V
7	12.02V	2.28V	1.7V
8	9.43V	2.6V	1.94V
12	7.03V	12.03V	12.69V
14	10.37V	0.1V	0
16	0.25V	3.59V	3.55
20	12.07V	2.18V	1.06V
23	4.32V	1.94V	1.34V
24	1.43V	12.04V	12.68V
26	12.02V	1.04V	0.4V
27	3.2V	1.05V	12.68V
28	2.04V	12.04V	12.68V
29	12.05V	1.37V	0.79V
30	1.94V	12.04V	12.68V
31	12.04V	2.16V	1.57V
33	4.96V	4.24V	5.04V
36	0	10.27V	5.41V
37	11.96V	0	0
38	3.74V	0.6V	0
40	3.97V	3.87V	3.23V
42	2.6V	0	0

Electrical Parts List (Continued from last page)

Description	Ref. No.	Pt. No.
	Capacitors	
	Mylar	
0.022UF	C42	
0.082UF	C21,24	
	Polyester	
0.001UF	C8	
0.047UF	C29	
0.1UF	C11,54	
0.22UF	C612	
0.47UF	C88,94,95	
	Metal Film ⚠	
0.1UF CL-2X	C600	242347

Amstrad reserves the right to supply selective components

Note For The Engineers

Please note which type of Satellite dish and type of LNB is installed when installing this equipment.

This receiver is factory set for SLB3 or TLB3. To use older type of Amstrad LNB, change receivers local oscillator setting to 10GHz. Todo this , press set-uop repeatedly so installation menu is displayed on the screen. Press select + to change LNB setting to 10.000GHz and then exit.

Reset:

To achieve full factory reset
1. Set in standby mode,
2. Press OK, Set-up and Status button in sequence on to handset,
3. Hold Set-up button pressed down until LEDs on the front start to flash.
   Now the set is in full reset mode.

Electrical Parts List

Ref. No.	Description	Pt. No.
	ICs	
IC1,9,10	IV MC14053BCP / TC4053BP	152353
IC2	IC TDA6160-2X	241395
IC3	IC LM1894N	241393
IC4	IC 24C16P EEPROM	242222
IC5	IC 68HC05D24 CPU 42803-600	242796
IC6	IC 78L05AC Regulator	250009
IC7	RF Modulator PAL/G Ch30-40 5V	242178
IC8	IC UPC6450CX-002	241531
IC500-503	IC 74LS164 Shift Register	193004
IC504	IC IR Sensor PRM-638CBRS-L	242466
IC505	IC 7 Segment LED LYQG62	242797
IC600	IC CNY17F3XG Optocoupler	242458
IC601	IC TL431CLP Shunt Regulator	241538
IC602	IC LM2574N-ADJ	242456
IC603	IC LM2937ET-12	242459
IC604 ⚠	IC TOP202VA Sw Control	242457
	Transistors	
TR1,3,5,6,12 13,16,18,24 25,27,28,30 33,36	Tr 2SA933	150874
TR2,4,7,8,10 11,14,15,17 19-23,26,29 31,32,34,35 37,38,41,42 401,402,800	Tr 2SC1740 R	50016
TR43	Tr DTC124ES	152050
TR44	Tr DTA114E	273263
	Diodes	
D1	D BB609B	241430
D2-6,604	D 1N4148	270754
D7	DZ BZX55-C6V8	240377
D8	DZ 27V ½W	241233
D601 ⚠	D Bridge DF10M	241403
D602	DZ BZV47C200	242451
D603 ⚠	D SRP100K	242447
D606	D BAT42 Schottky	242450
D607,609 611 ⚠	D BYT53F	242667

Ref. No.	Description	Pt. No.
	ICs	
	Coils	
L1,13	Coil 100µH TOYO	
L2	Coil 3.9µH	
L3	Coil 3.3µH	
L4,5	Coil 5.6µH	
L6	Coil 10µH	
L7	Coil 1.2µH 5%	
L8	Coil 10µH 5%	
L9	Coil 18µH	
L10	Coil 1.8µH	
L11	Coil 33µH	
L12,15,401	Coil 100µH	
L16	Coil Choke 100µH 700MA	242478
L601	Coil Ln Fltr 10mH UU9LF-B103	242454
L602	Coil Choke RCR110D-102LY	242453
L603	Coil Choke 33µH 2A	242452
	Miscellaneous	
C91	Trimmer Cap 40pf	
FS600 ⚠	Fuse T 1.25A 250V	240083
	RF Cable CATV Type	153048
	Carton	242479
	Poly Packing	241629
	User Instructions	242480
	Remote Control Hadset	242415
SK2-4	Scart Socket 21 Pin	153030
SK5	2P Red/White Phono Socket	240798
S500-502	Sw Tact 4 Pin	242414
SL1,2	Slide Switch	240800
T600 ⚠	Tx Switching LLP100TH	242436
TU1	Tuner Assy V1.4	242192
VR1	VRSF 500 Ω	241638
VR600	VRSF 2.2K Ω Linear	
XL1,3	Cer Filter SFE10.7MJA10K-A	241027
XL2,4	Cer Filter SFE10.52MJA10K-A	241028
XL5	Cer Filter 10.7MA19	254401
XL6,8	Cer Descri'tor CD10.7MG44V	240076
XL7	Cer Descri'tor CDA10.52MG44V	240077
XL11	Crystal 17.73447MHz	241640
XL401	Crystal 4MHZ 20ppm	254427

Description	Ref. No.	Pt. No.
	Resistors	
	Carbon Film 1/6w	
1.5 Ω	R bet IC603 Pin 1&3	
47 Ω	R605,607	
75 Ω	R110,115	
100 Ω	R35,36,59,60,73,76,116,120 121,123,165,405,534	
120 Ω	R10	
150 Ω	R8,14,15,106,111,173	
180 Ω	R176	
220 Ω	R3,50	
240 Ω	R71	
270 Ω	R97,99,157,158,203,204	
330 Ω	R39-41,93,404	
390 Ω	R49	
470 Ω	R1,7,9,47,48,51,65,100,103,108 113,118,130,144,504-532,613	
560 Ω	R34,37	
750 Ω	R19,67,72,200,201	
820 Ω	R28,70	
910 Ω	R29,30	
1K Ω 1%	R609,614,617	
1K Ω	R11,12,21,22,31,57,58,61-63,87 88,124-126,133,612,801	
2K Ω	R137	
2.2K Ω	R26,33	
2.7K Ω	R16	
3K Ω	R107,112	
3.3K Ω 1%	R611	
3.3K Ω	R82,142,403	
3.9K Ω	R206	
4.7K Ω	R23,24,86,117,148,154,155	
5.1K Ω	R145	
6.8K Ω	R27,74	
8.2K Ω	R66	
10K Ω 1%	R608	
10K Ω	R4,5,17,18,43,68,69,79,80,104 135,136,138,146,147,152,153 172,202,500-503,802	
15K Ω	R38,89,90,101	
22K Ω	R2,77,83,98,109,114,119,141 171	
27K Ω	R52,131	
47K Ω	R6,13,25,78,91,92,401	
56K Ω	R402	
100K Ω	R44,53,64,81,132,143,156,803	
150K Ω	R75	
470K Ω	R159	
	Resistor 1w	
1K Ω	R606	242481

Description	Ref. No.	Pt. No.
	Resistors ¼W	
1 Ω	R533	
27 Ω	R32	
75 Ω	R54-56,84,85,102,129	
100 Ω	R616	
1M Ω	R602	
	Capacitors	
	Ceramic	
8pF	C111	
10pF	C bet TR7 B &C	
15pF	C84	
18pF	C402	
22pF	C5,37,61,83	
33pF	C53	
47pF	C58	
47pF 1kV ⚠	C604	
56pF	C7,90,105	
82pF	C19	
100pF	C59	
150pF	C4,106,504	
200pF	C3,10	
220pF	C403,404	
270pF	C36	
330pF	C63	
680pF	C17	
0.001µF	C25,34,98,110,401	
0.0033µF	C27,28,60	
0.0047µF	C104	
0.01µF	C9,30,33,35,38,114,407	
0.047µF	C20	
0.1µF	C2,12,16,26,39,40,41,56,57,82 85,87,89,100,107,500-503	
0.1µF ⚠	607,609,624	
	Electrolytic	
1µF 50V	C31,43,102,103	
4.7µF 50V	C617	
10µF 16V	C14,15,22,23,45,48-50,64-80	
10µF 35V	C113	
10µF 16V	C18,44,55,62,93,406	
22µF 25V	C603	
47µF 16V	C606	
47µF 400V	C605	
100µF 10V	C505	
100µF 16V	C621	
100µF 25V	C616	
220µF 35V	C610	
470µF 6.3V	C46	
470µF 10V	C619	
470µF 16V	C614	
1000µF 10V	C613	